International comparisons of expenditures for education

The proportion of total financial resources that a country chooses to invest in education is an indication of the relative importance that a country places on education, as well as an indication of where the responsibility lies for funding education in that country. International comparisons of expenditures for education vary considerably in the share of national resources devoted to education, the sources (public or private) of funds spent on education, and the levels of education to which funds are allocated.

- In 1994, total expenditures on primary and secondary education made up 3.9 percent of the Gross Domestic Product (GDP) in the United States, while higher education expenditures made up 2.3 percent. Total expenditures for all education levels and sources combined made up 6.6 percent of the GDP. Of the G-7 countries, Canada and France spent a larger percentage on primary and secondary education, and only Canada spent a larger fraction than the United States for higher education and for all levels combined.

- Some countries rely more heavily than others on expenditures from private sources to finance education. For example, in both the United States and Japan, the percentage of GDP spent on higher education from private sources (1.2 and 0.6, respectively) was higher than the percentage from public sources (1.1 and 0.5). In other G-7 countries, the percentage from private sources was much smaller than the percentage from public sources.

- In 1994, expenditures per student for the G-7 countries at the primary-secondary level ranged from $3,900 in the United Kingdom to $5,900 in the United States. For higher education, however, expenditures per student varied. The United States spent more per higher education student than any other G-7 country, and spent more than twice the amount spent in France, Italy, and the United Kingdom.

Public and private expenditures on educational institutions,[1] by level of education and country: 1994

	As a percentage of GDP					Per student[2]			
	Primary-secondary		Higher education		All levels and sources combined[6]	Constant 1994 U.S dollars[3]		As a percentage of GDP per capita	
G-7 country	Public sources[4]	Private sources[5]	Public sources[4]	Private sources[5]		Primary-secondary[7]	Higher education	Primary-secondary[7]	Higher education
Canada	4.2	0.3	2.3	0.2	7.2	—	$11,300	—	56.0
France	4.0	0.3	0.9	0.2	6.2	$4,783	6,010	24.9	31.0
Germany	2.9	0.9	0.9	0.1	5.8	5,262	8,380	26.8	43.0
Italy	3.3	0.0	0.7	0.1	4.7	4,933	4,850	26.5	26.0
Japan	2.9	0.2	0.5	0.6	4.9	4,362	8,880	20.6	42.0
United Kingdom	3.8	—	1.0	0.0	—	3,914	7,600	22.2	43.0
United States	3.5	0.4	1.1	1.2	6.6	5,944	15,510	23.3	61.0

— Not available.

[1] Includes all institutions (public and private), except for Germany and Italy, which include only public institutions, and the United Kingdom, which includes public and government-dependent private institutions.

[2] Per-student expenditures are calculated based on full-time-equivalent (FTE) enrollment figures, and expenditures from both public and private sources, with the exception of the United Kingdom, for which private source data are unavailable.

[3] Purchasing Power Parity (PPP) indices were used to convert other currencies to U.S. dollars. Because the fiscal year has a different starting date depending on the country, within-country Consumer Price Indices (CPIs) were used to adjust the PPP indices to account for inflation. See the supplemental note to this indicator for further explanation.

[4] Public expenditures are defined as direct public expenditures on educational institutions plus public subsidies to households and other private entities for educational institutions (e.g., tuition and fees), excluding other public aid to students and households (e.g., subsidies for student living costs).

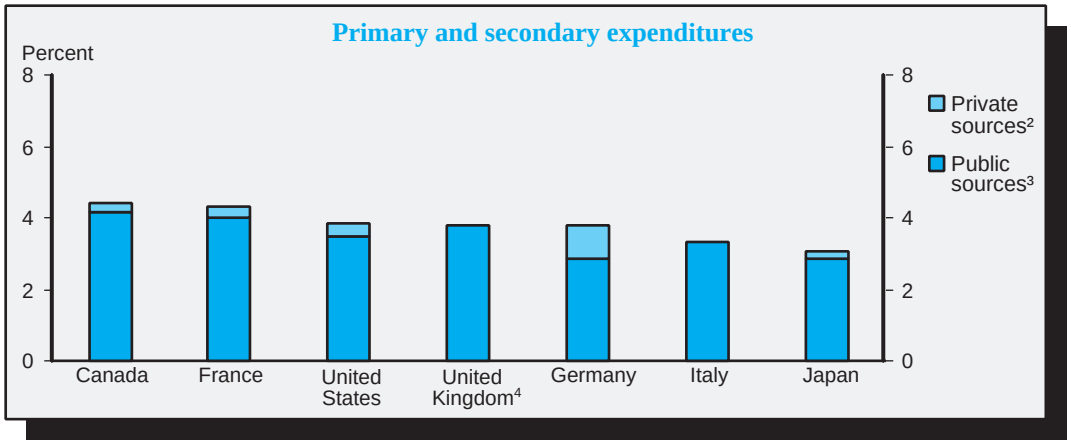
[5] Private expenditures are defined as private payments from households and other private entities to educational institutions, subtracting any portion derived from public subsidies.

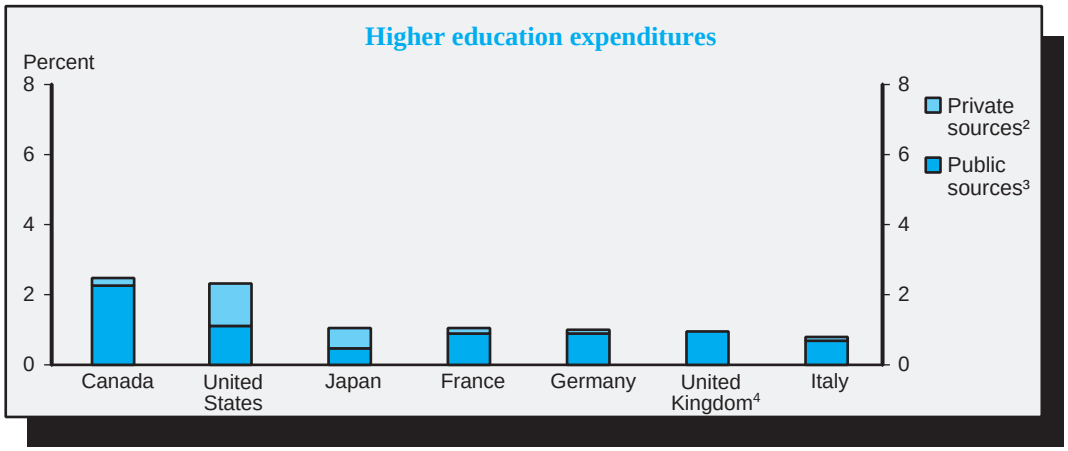
[6] "All levels combined" includes expenditures on pre-primary education, and funds classified as "undistributed," a classification reserved for enrollments, expenditures, or programs that cannot be unambiguously assigned to the International Standard Classification of Education (ISCED) defined levels. Examples of undistributed education can include non-graded special education or recreational non-degree adult education programs.

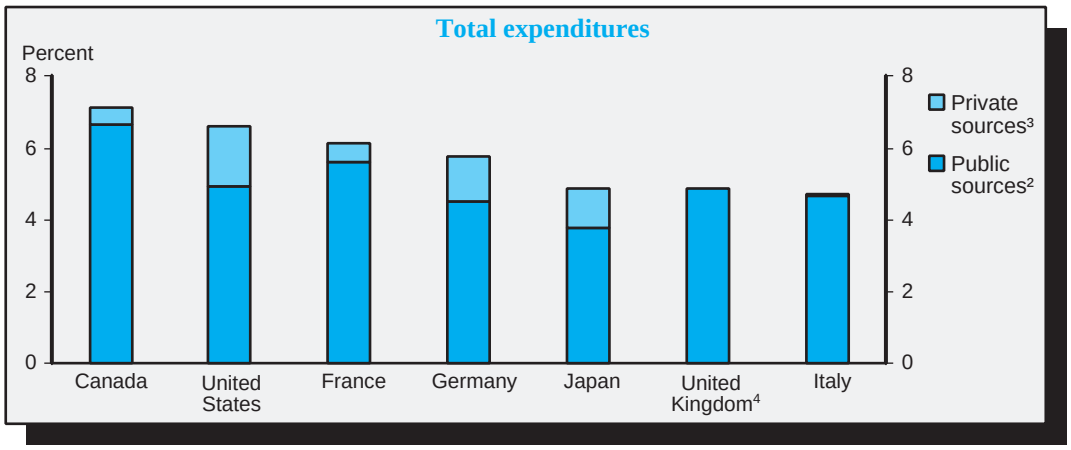
[7] Primary-secondary per-student expenditures were calculated by adding primary and secondary FTE enrollments and dividing the total FTE into total expenditures. See the supplemental note to this indicator for further discussion.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education At A Glance: OECD Indicators*, 1997.

Public and private expenditures on educational institutions[1] in G-7 countries as a percentage of GDP, by level of education and source of funds: 1994







[1] Includes all institutions (public and private), except for Germany and Italy, which include only public institutions, and the United Kingdom, which includes public and government-dependent private institutions.

[2] Private expenditures are defined as private payments from households and other private entities to educational institutions, subtracting any portion derived from public subsidies.

[3] Public expenditures are defined as direct public expenditures on educational institutions plus public subsidies to households and other private entities for educational institutions (e.g., tuition and fees), excluding other public aid to students and households (e.g., subsidies for student living costs).

[4] Data for the United Kingdom are not available.

NOTE: Private sources of funds for some countries are less than 1 percent; therefore, percentages may not be discernable in the graphs.

SOURCE: Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education At A Glance: OECD Indicators*, 1997.

Note to Indicator 56: International comparisons of education expenditures

The purpose of this analysis is to compare expenditures for education in public and private institutions to Gross Domestic Product (GDP) and school enrollment.

Definitions

Public education expenditures include funds provided to both public and private schools by federal, state, and local governments either directly or through students. This includes expenditures at public schools funded by public sources and subsidies to students at private schools from government agencies.

Private education expenditures are expenditures financed by private sources—households, private nonprofit institutions, businesses, and corporations. For example, this includes expenditures supported by public and private school tuition and fees, such as student expenses for books and materials.

Gross Domestic Product (GDP) is an aggregate measure of the value of goods and services produced in a country.

Expenditures in the United States

Primary and secondary education

For the United States, public expenditures for primary and secondary education include expenditures in local public school districts and private schools; schools administered by religious organizations, funded by state and local taxes, federal programs administered by the U.S. Department of Education (ED); and federal programs operated outside of ED that are not administered by state or local education agencies (e.g., Head Start, Department of Defense Schools, and schools operated by the Bureau of Indian Affairs).

Also included in public expenditures for primary and secondary education are federal expenditures to operate ED and activities such as research, statistics, assessment, and school improvement, and state expenditures to operate state departments of education and other direct state expenditures, including state schools for the deaf and blind and reform schools.

Some expenditures, such as those for federal or state agency administration and those for non-graded special education programs, cannot be assigned to particular grade levels, because the expenditures defy strict grade-level categorizations. The United States, like some other countries, has chosen to prorate these expenditures over the grade levels based on the relative size of enrollments, staffing, and teacher salaries. However, other countries have chosen not to allocate such expenditures, classifying them, instead, as "undistributed."

Higher education

Public expenditures for higher education in the United States include expenditures at both public and private colleges and universities funded by federal, state, and local governments. The Integrated Postsecondary Education Data System (IPEDS), the core postsecondary education data collection program for the National Center for Education Statistics (NCES), gathers institutional reports for revenue received by both public and private institutions from both public and private sources. Expenditures by public and private nonprofit institutions are separated into public and private expenditures based on their relative shares of current fund revenues.

Most federal aid goes to students who then spend it on education (e.g., tuition) and non-education (room and board) services. For the purposes of calculating public expenditures for higher education in the United States, it was assumed that students spent 60 percent of federally administered Pell grants on education.

With the exception of Pell grant money, public expenditures for less-than-2-year public and private institutions, often called "proprietary" schools, were not available; therefore, public expenditures for higher education in the United States are biased downward. However, since the students participating in these institutions are also excluded from higher education enrollments, the estimate of public expenditures per student would be biased upward if the per-student public expenditures in less-than-2-year institutions were less than those in other higher education institutions.

Private expenditures

For the United States, as in other Organization for Economic Co-operation and Development (OECD) countries, private expenditures refers to expenditures funded by private sources—mainly

households, private non-profit institutions, and firms and businesses. It includes school fees; materials such as textbooks and teaching equipment; transport to school (if organized by the school); meals (if provided by the school); boarding fees; and expenditures by employers for initial vocational training.

Per student expenditures

Per student expenditures are a measure of the average investment per student in the education system. They are calculated as total expenditures, funded by both public and private sources, divided by enrollment in both public and private schools.

The data for per-student expenditures in higher education come directly from tables in *Education at A Glance (EAG)* published by the Organization for Economic Co-operation and Development in 1997. However, the EAG tables include per student expenditures broken down by early childhood, primary, secondary, and higher education.

For this analysis, the primary and secondary figures were recalculated to generate one expenditure figure for the primary and secondary levels combined. This was done by, first, adding the full-time-equivalent enrollment (FTE) numbers for primary and secondary education (see table 1) to determine total FTE. Second, total expenditures were calculated by multiplying the FTE numbers by expenditures per student, for primary and secondary education, and then adding these two figures together to determine total expenditures for primary-secondary education. Finally, total expenditures on primary and secondary education were divided by total enrollment in the primary and secondary levels to determine per student expenditures for primary-secondary education. These recalculated figures were divided by GDP per capita (see table 1) to determine per pupil expenditures for primary-secondary education as a percentage of GDP per capita.

Table 1. Preprimary and secondary full-time-equivalent (FTE) enrollments and GDP per capita for G-7 countries

Country	Primary FTE	Secondary FTE	GDP per capita (in constant 1994 dollars)
Canada	2,400,819	2,455,427	$20,297.72
France	4,100,574	5,993,746	19,233.30
Germany	3,603,943	7,664,633	19,668.28
Italy	2,602,233	4,568,362	18,647.74
Japan	8,798,082	10,258,356	21,170.46
U.K.	4,865,514	5,278,568	17,621.73
U.S.	23,426,455	20,601,665	25,512.28

SOURCE: Organization for Economic Co-operation and Development, Centre for Educational Research and Innovation, *Education at A Glance: OECD Indicators*, 1997, table X2.1 (http://www.oecd.org/els/stats/els_stat.htm, table B4.1).

How students are classified

The International Standard Classification of Education (ISCED) was designed as an instrument for presenting statistics of education internationally, so that comparisons could be made among countries. Many countries report education statistics to UNESCO and OECD using the ISCED. In this classification system, education is divided into several levels.

The following are summary definitions used in this analysis:

- Education preceding the first level (early childhood education) where it is provided, usually begins at age 3, 4, or 5 (sometimes earlier) and lasts for 1–3 years. For the United States, this would be mostly nursery schools and kindergarten classes.
- Education at the first level (primary education) usually begins at age 5, 6, or 7 and lasts for about 5 or 6 years. For the United States, the first level starts with grade 1 and ends with grade 6.
- Education at the second level (lower secondary education) begins at age 11 or 12 and lasts for about 3 years. For the United States, the second level starts with grade 7 and ends with grade 9.
- Education at the third level (upper secondary education) begins at about age 14 or 15 and lasts for about 3 years. For the United States, the third level starts with grade 10 and ends with grade 12.
- Education at the fifth level (non-university higher education) is provided at community colleges, vocational-technical colleges, and other degree-granting institutes whose programs typically take 2 years or more, but less than 4 years, to complete.
- Education at the sixth level (university higher education) is provided in undergraduate pro-

grams at 4-year colleges and universities in the United States and, generally, at universities in other countries. Completion of education at the third level (upper secondary education) is usually required as a minimum condition of admission, and admission is, in many cases, competitive.

- Education at the seventh level (graduate and professional higher education) is provided in graduate and professional schools that generally require a university diploma as a minimum condition for admission.

- Education at the ninth level (undistributed) is a classification reserved for enrollments, expenditures, or programs that cannot be unambiguously assigned to one of the aforementioned levels. Some countries, for example, assign non-graded special education or recreational non-degree adult education programs to this level. Other countries assign nothing to this level, preferring instead to allocate enrollments, expenditures, and programs to levels as best they can.

How expenditures are compared across countries

To compare expenditures per student in the United States to expenditures per student in other countries, expenditures must be denominated in a common currency. Conversion of other countries' expenditures to U.S. dollars facilitates comparison with expenditures in the United States. There are at least two methods of conversion: 1) market exchange rates and 2) Purchasing Power Parity (PPP) indices.

The market exchange rate is the rate at which an individual can exchange the currencies of two countries. It is determined by relative confidence in the governments, their monetary systems, and the economies of the two countries and by the relative demand for the goods and services that the two countries trade. Market exchange rates can be highly volatile.[1]

PPP indices are calculated by comparing the cost of a fixed market basket of goods in each country. Changes over time in a PPP index are determined by the rates of inflation in each country. Since PPP indices are less volatile than market exchange rates, they were used here to adjust expenditures and GDP figures.[2]

Because the fiscal year has a different starting month in different countries, within-country GDP consumer price deflators from the OECD National Accounts database were used to adjust education expenditures where the national financial year does not coincide with the calendar year 1994.

Problems in comparing education expenditures across countries

Comparing national expenditures on education can be difficult because the data are dependent on numerous factors, including the size of the economy, the population, and enrollment rates. In addition, the coverage and character of the education expenditure data that countries submit to the OECD vary somewhat. Sometimes an individual expenditure item may be included in the expenditure data from one country, but may not be included in those from another. Below, we examine some of the problems that exist in comparing education expenditures across countries.

Size of the economy: Because GDP levels are the measure against which education expenditures are compared in this analysis, a country's wealth has a significant effect on the amount of resources that can be devoted to education.

Size of the population: The youth population, constituting those between the ages of 5 and 29, is the population that demands the investment of resources in education and training. The greater this population is, the more a country has to spend on education; the smaller the population is, the less a country has to spend on education.

Enrollment rates: Enrollment rates also affect the amount of resources a country needs to invest in education. The proportion of persons between the ages of 5 and 29 who are enrolled either full time or part time in early childhood, primary, secondary, or higher education varies widely across countries. For example, this proportion ranges from less than 32 percent in Germany, Luxembourg, Sweden, and Switzerland to more then 50 percent in Turkey and Mexico.[3]

Discrepancies in expenditure data arise because one country may collect certain kinds of data that another country either does not collect, or does not collect in its "education" data collections. Or, one country may define what constitutes an "education" expenditure differently than another country does. Discrepancies between which expenditure

items are included in one country's expenditure figures and not in another's tend to arise in four general domains:

Non-instructional (ancillary) services: Some countries provide fewer ancillary services in their schools and, thus, include fewer expenditures for such services in their education expenditure figures. Examples of ancillary services are school cafeterias; dormitories; intramural school sports programs; school health clinics or visiting school nurse services; attendance (i.e., truancy) services; and speech or psychological therapy services. U.S. schools tend to subsidize relatively more ancillary services through their education budgets than do schools in most other countries. In some countries (e.g., Germany), *none* of the aforementioned services are provided at the primary and lower secondary levels by many schools.

Private expenditures: Some countries' education systems receive large private contributions. The most common forms of private contributions to education are student tuition or fees; organizational subsidies, such as those provided by religious denominations to their own schools; and corporate in-kind contributions, such as those provided by German and Austrian firms to fund vocational courses on the shop floor for participating youth apprentices. Most national education statistics collections attempt to include estimates for such expenditures. However, other private expenditures may be overlooked more often by education data gatherers. Students' or parents' own spending on school supplies, or community organizations' charitable grants and loans to individual students, for example, can only be estimated with the help of household expenditure surveys and diligent perusal of statistical collections outside the domain of traditional educational institutions.

The boundaries of education: Fewer (though, still some) inconsistencies arise when comparing the *instructional* expenditures for *primary* and *secondary* public education in the *academic* track. But, the "borderlands" of education, in particular, tend to cause comparability problems. These borderlands include early childhood education and day care, special education, adult education, vocational/technical education, and proprietary education. Some countries, for example, simply do not collect expenditure data for private "center-based" day care because they do not define this as "education." Indeed, in some countries, even public day care is not managed by education authorities; rather, it is the responsibility of human services departments.

The exact location of each "boundary" also varies from country to country and even within each country. In Canada, for example, vocational students in Québec enter vocational/technical college in the 12th grade, while in the other Canadian provinces with vocational/technical colleges, they enter in the 13th or 14th grade. Thus, vocational/technical students in the other provinces spend another year or two at the upper secondary level. The more time the average student spends in a level of education, the greater will be the expenditures at that level.

University research: Because university spending includes substantial expenditures on research, comparing expenditures on higher education can often be misleading. The proportion of total university spending that is invested in research varies widely, specifically because of variations in the proportion of total national research and development (R & D) that is performed within the domain of higher education institutions.

In addition to variations among countries regarding the production of R & D, countries have not reported their research spending to the same extent when submitting data that were used for this indicator. For example, some countries exclude separately funded or budgeted research, while others include nearly all research outlays by institutions of higher education, when reporting higher education expenditure figures.

Even these four domains do not include all the possible comparability problems. There remain, for example, inconsistencies in how different countries treat public contributions to teacher retirement and fringe benefits, student financial aid, and hospitals.

NCES sponsored a study designed to examine the comparability of national figures on education expenditures. The two-volume study, entitled the *International Education Expenditure Comparability Study,* involved 10 countries and examined in detail the content of the education expenditure data they reported to the OECD.[4]

Thus far, participating education ministries have been receptive to the idea of improving comparability in the OECD data collection. Indeed, some countries had already modified their data submissions to the OECD for the 1993–94 school year, thus improving the comparability of education expenditures across countries for the data used for *The Condition of Education, 1998*. Further improvements were made to the data submissions to the OECD for the 1994–95 school year, the data used for this report. These changes were motivated in part by

preliminary findings from the NCES expenditure comparability studies.[5]

NOTES:

[1] For a further argument against using market exchange rates, see Edith M. Rasel and Lawrence Mishel, *Short-changing Education*, Economic Policy Institute, January 1990.

[2] PPP Indices for other aggregates such as private consumption expenditures are available. See Stephen M. Barro, *International Comparisons of Education Spending: Some Conceptual and Methodological Issues*, SMB Economic Research, Inc., April 1990, for a discussion of the strengths and weaknesses of using various indices.

[3] Organization for Economic Co-operation and Development, Center for Educational Research and Innovation, *Education at A Glance, OECD Indicators*. Author: Paris, France, 1997, p. 57.

[4] U.S. Department of Education, National Center for Education Statistics. *International Education Expenditure Comparability Study: Final Report*, Volume I, Working Paper No. 97–16, by Stephen M. Barro, and Volume II, Working Paper 97–17, by Joel D. Sherman and Richard P. Phelps, Project Officer, Shelley Burns. Washington, D.C.: 1997.

[5] Stephen M. Barro. *Preliminary Findings from the Expenditure Comparability Study.* SMB Economic Research, Inc., June 1993.